the least. They are subordinate to nothing in nothing,—in no single respect, from choice of subject down to choice of stone,—in all things totally lawless, pieces of pure selfishness, pure isolation; designed hoodwinked, with one eye shut and a microscope to the other,—invaluable perhaps as the only perfect exemplars of everything that must not be done. Could we but exactly reverse everything in them, we should have what we want.

But what qualities of the ornamentation must be settled first?—the artistic or the mechanical? First, I think the mechanical, because these, in all true ornament, partly govern the artistic, but are nowise governed by them. They governed anciently in many cases, even, I believe, the choice of subject; but, certainly, always its artistic treatment. In true decorative art, glass does not attempt the same kinds of resemblances to nature as oil-painting, nor painting the same as carving, nor carving the same as inlaying; but each material and manipulation does what it can do well, and nothing more.

Now, with regard to material, there are certain parts of the interior of every large church or speaking-room, that require to be lined with matters incapable of reflecting sound, as cloth, canvas, or tapestry. Before the laws of reflection and sound were known, men had of course no remedy against the prolonged confusing reverberations from bare walls and vaults, but by lining them entirely, or as much as they could afford, with these materials; but since these laws are part of our knowledge, every architect who chooses to take the trouble can ascertain what parts of the surfaces of any building require this treatment, and on which parts it would be thrown away. Some few reverberating surfaces (as the sounding-board of a pulpit) are thus seen to be rather advantageous than not, because if the sound-waves are brought to a hearer by suffering reflexion at a point near the speaker or himself, say within 30 or 40 feet of either, their route is not so much longer than that of the direct waves as to make a perceptible difference of time in the arrival of the direct and the reflected sound, which thus strengthens it. But if the reflection or reflections bring it to us by such a circuitous route as to be 60 or 80 feet longer than the direct path, every articulation will come $\frac{1}{10}$ or $\frac{1}{15}$ of a second later by reflexion than by the direct waves, which is delay enough to confuse one letter with the next; and with double or treble this distance, one syllable with the next. But where, as in this case, only part of the building is occupied by the hearers, there are some surfaces (in this case very many) which only reflect waves from the speaker away into the unoccupied parts, from whence, however many times reflected, and bandied to and fro, they cannot return to the auditory without having struck some one or other of certain few surfaces; so that if *these few* be rendered non-reflecting by a soft covering, all the reverberation heard in the auditory will cease, however much may be heard by persons elsewhere; for we need not care how far these echoes travel, and are repeated, in the empty parts, provided they do not again enter the auditory, which they cannot do without rebounding from one of these critical surfaces, which are therefore the places at which to stop and absorb it by yielding hangings.

Now, when the auditory shall be in its permanent place, under the dome, I find the surfaces needing this treatment will not be at all more extensive than at present, though the congregation be at least six times as great. A careful investigation will show that no sound coming from the central octagon can return thither in any number of reflections, without having bounded from one of these following, which I enumerate in the order of their importance:—

1. The concavity of the dome, from its eye down to the cornice.

2. The four end walls of the building's arms, from floor to ceiling.

3. The east side of each pier in the nave, a few feet upward from the floor, and the soffit of the arch above, a few feet upward from its springing.

4. The four casts behind the statues of Johnson, Reynolds, &c. a few feet up from the floor.

5. The inward faces of the eight great piers, up to half the height of the highest occupied gallery.

6. The four lower half domes, *if they have no galleries below them*; for if the sound they reverberate (mostly downward) has to descend to the people on the floor, it will be delayed enough to interfere with the direct sound, but if intercepted (like that from the *upper* half-domes) by a gallery only 20 or 30 feet below the reflecting surface, it will, instead of confusing, aid the hearing for people in that gallery; so that the half-domes must in that case be left hard and smooth, as also the flatter half-domes inserted to support such galleries, which will similarly reflect down to the people on the floor beneath them.

We have then to cover with textile material, *at least* the dome and four end walls. Let us first consider the dome. Whatever the clothing be (and nothing but experiment can determine how thick or thin it may be, whether mere felt or some kind of matting, and whether admitting for cleanliness a smooth covering of India-rubber or not), whatever it be, there must be numerous ribs, fillets, bands or plates of stiff material, to hold it to the concavity by slender belts of brass, passing through the shell. Now these *flatteners* (as I will call them, whatever shape they take) are the natural ornaments of the surface, and (unless it be embroidered) the only ones that will not be superfluous and false. All that their mechanical use calls for is a pretty equal distribution, never leaving more than a certain maximum breadth of cloth between them. Shall they then form ribs or bands, dividing the whole into panels? I think not, because I think the glory of a dome is its entirety, and therefore quite agree with Ruskin in regarding either the mimicry of Grecian flat-ceiling-structure, distorted into the dome of the Pantheon, or the mimicry of gardeners' parterres in that of St. Peter's, or any other *cutting up* of a dome, as barbarisms. If a ceiling have organism in its structure, as the Greek lacunaria or Gothic vaults, by all means show the organs and decorate them (instead of smothering all up with an inverted plaster floor, and then wondering at its unmanageableness); but if the work have no organism, then you have got what you spend so much elsewhere to obtain, an unbroken surface. So, instead of forthwith looking for sham organs to stick on, because some one else has beautified them for you, beautify the whole as a whole, not with forms of *architecture* but of *nature*.

I would say, then, keep the surface entire; let not the figures divide it, but it *them*. Put as many and as large as you like, but let them be separate and distinct, shining, floating, flying, as orbs, clouds, birds, angels, on one unbroken firmament of blue or purple. Moreover, distinctness of meaning absolutely requires, at such a distance, that the figures, human or not, be each cut out entire, and not overlapping. Here, as in ancient vases, and Early English glass-painting, the artist's means of expression are confined to outline. Use perspective in its place,—not here. If you have no artist who will work *for the place*, you can have no real ornament; for all true ornament is *made for its place*, and none is worth having that is not so. Artists who think the place made *for them*, to display their particular talents or tricks in, cannot decorate the church at all.

Now, as for the material and mechanism of these figures, to be understood they will at least require strong lines on their surface, as on those of ancient vases and mediæval brasses. Therefore, whether they have shadowing or not, and whether positive and varied colouring or not, they will need a surface durable, retaining its colour, and that frees itself of dust. No material answers these wants one quarter so well as glass; and this may be opaque, or transparent, or partly both. I think it should be transparent, because then the lines or shadows, instead of being on the face (where they would require for permanence to be enamelled and burnt in), may be on the back, safely protected, though merely drawn in paint. Moreover, by using flashed, or coated glass, and abrading or etching away the coloured layer, white lights may be left; and if the back were then silvered, the silvering might be removed in lines of coarse hatching from the shadows, and thus a scale of the utmost compass obtained, from silver white to jet black, which would give the figures extraordinary force at a distance, and more than either the brilliancy or permanence of the Italian mosaics, at an expense not to be compared with them; and any number of pieces might be united into one figure, by making the junctions follow dark lines or shadows, and interposing fillets of lead or copper similar to those enclosing its outline, which need not exceed half an inch wide (quite invisible from the floor), and be held to the vault by thin bolts passing through it.

The same treatment will apply to the half-domes, and, with coloured plaster in place of the cloth, to the vaulting in general, which, however, seems to me to have (with the single exception of those half-domes) its full share of decoration at present; nor would I add any more till, not only every window, but every blank panel, whether of the aisles or of the attic story, had been filled.

Now, of the hangings to the end walls or other vertical surfaces, as they will be readily accessible for cleaning, and exposed to near as well as distant view, I would make themselves instead of their attachments the chief field of ornament; *i. e.* embroider them, and let the attachments confine themselves to a mere perforated border or frame round each panel, and be either of brass or of some other metal coated with nickel, which combines the durability of gold with the colour and cheapness of silver, and will, I am convinced, be of great future use in protecting the metallic parts of architecture.

These tapestries will in general call for more skilful design than any other decorations; for they must have something for view at 100 feet distance, something at 30, something at 10, something at 3 feet. If the work of looms, it had far better be of dead than of live ones: but I doubt if the mind and the mechanical power can in this work be *totally* separated with any tolerable result. All I insist on, however, is, that if they be so, the machine-work should be done by machines: for hands to do it, is returning to worse than the days of pyramid-building.

Three kinds of surface remain to be considered,—stone wall, plastered wall, and window glass (for the doors are such a minor affair as need influence nothing else, and the floor, with deference to Mr. Papworth, I do not think could be made much nobler or fitter than at present). Now, the stone-work, with two exceptions, is all either decorated already or in panels. The two exceptions are the pendentives between the dome arches, and the ugly-shaped pieces (Ruskin would call them "carving-knives") flanking each of the diagonal tribunes, and which are to me the greatest eyesore in the whole building. Both these parts are subject to enormous pressure, and it is plain that Wren feared to reduce them by carving or even the shallowest panelling. We have the alternative of attaching metal figures, either engraved like mediæval brasses or in relief, or glass figures like those in the dome; and the subjects (the choice of which I find I must leave to another letter) will decide between these manipulations.

Panels, you will next observe, are everywhere either very shallow, or having tablets left nearly filling them. I cannot believe, therefore, that Wren intended any other treatment than *carving*, and that out of the substance of the walls. It need not exceed 3 inches deep in the lowest panels, and 9 inches or a foot in those of the clerestory; and if confined to the simplest of the classes of subjects I shall propose, would be quite as cheap as the worst pictorial painting that could possibly be tolerated. I would not fritter away means on any such temporary makeshifts, nor touch one of these panels except with the chisel.

Plaster (except that of the vaults already

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